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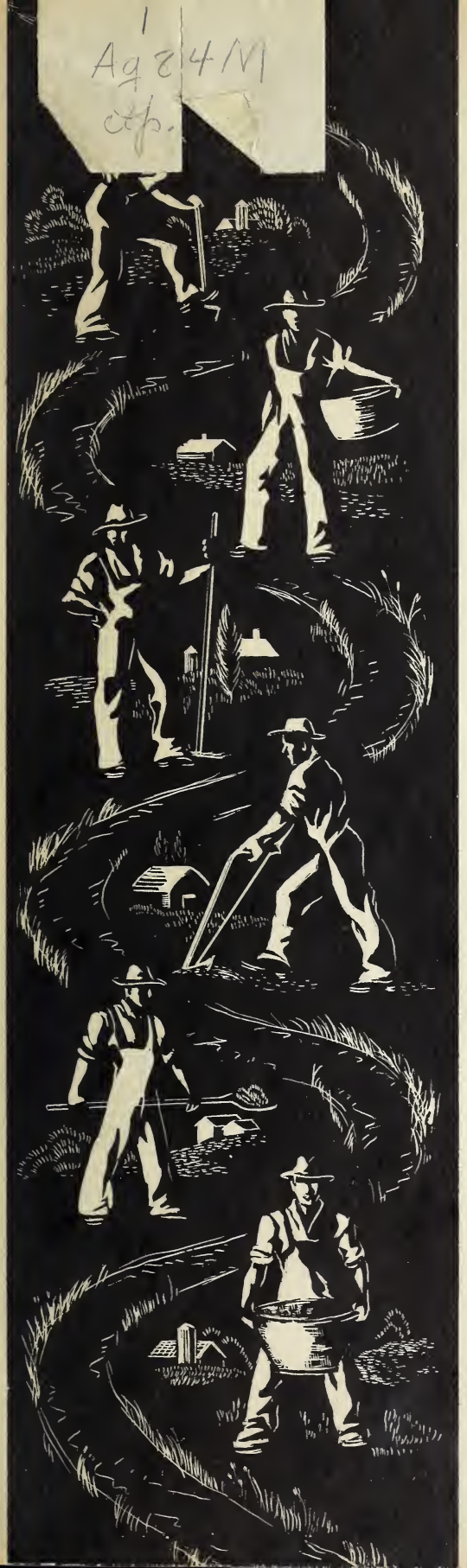

TEAMWORK TO SAVE SOIL AND INCREASE PRODUCTION

SOIL CONSERVATION SERVICE
UNITED STATES
DEPARTMENT OF AGRICULTURE

MISCELLANEOUS PUBLICATION NO. 486

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FOREWORD

If this country ever needed conservation, it needs it now, in the midst of war.

The fact that this bulletin was written before the United States became involved in the war has no bearing whatever on its true timeliness. There is a distinction between what is timely and what is merely topical. The author could have inserted a sentence or so about the war every two or three pages, and that would have made this publication topical. He did not have to do this to make it timely.

It is timely because what the author says is pertinent to the situation we're in today. American farmers are asked to produce more than they've ever been asked to produce before. This is essential for the war effort. We have to produce more food and fiber and timber than ever before, for the use of the Army and Navy, for the use of the civilian population working at top speed to back up the fighting forces, for the use of our Allies, and to help restore the world to an even keel after the war.

To do this job effectively, we have to protect our soil, water, timber, and other natural resources against the inevitable losses that would result from an unrestrained production spree. We have to guard against destruction of soil resources that might catch us short before the end of the war.

The only sound way to achieve this imperative is through conservation farming. The principles set down in this publication are the principles by which we can do the job.

These principles apply in war as well as in peace. The conservation program is flexible, and it has been streamlined to help us meet war crop needs. When those needs no longer exist, the wartime conservation work will provide the foundation for the comprehensive national conservation program America must build after the war. All these potentialities are here in what Mr. Waring has written.

Conservation really is timeless, and therefore always timely. If anything, this book is more timely now than it was before December 7.

H. H. BENNETT,
Chief, Soil Conservation Service.

Washington, May 1942.

TEAMWORK

TO SAVE SOIL AND

INCREASE PRODUCTION

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

MISCELLANEOUS PUBLICATION NO. 486

N J-10,130

An average-size farm for our neighborhood.

Many of the pictures in this publication were taken on the Honey Hollow Creek watershed. Others were taken on similar watersheds elsewhere. Each was selected as the best available photograph to bring out a conservation objective emphasized by the author.

TEAMWORK TO SAVE SOIL AND INCREASE PRODUCTION

Charlie is one of the six farmers on our creek. He has a poultry farm, an average-size place for our neighborhood, about 90 acres, I should say. On it he raises a good deal of the feed for his hens as well as a little for stock, and sometimes he plants a field of potatoes besides to help out the income.

PA-100.254

One of the best farmers in our neighborhood.

One day this fall we were husking corn in adjoining fields and stopped to talk for a while about this conservation farming we had begun in our neighborhood over a year ago. "Do you like it, Charlie?" I said. "Do you think it does you any good?"

Charlie is one of the best farmers in our neighborhood, and if he

liked this idea for saving soil and moisture, if he could make it work—well, that would be a big thing in its favor.

Charlie stopped husking and dumped a basket of corn in the wagon. "I like it," he said, and sounded more positive than I had expected. "I think it's real good."

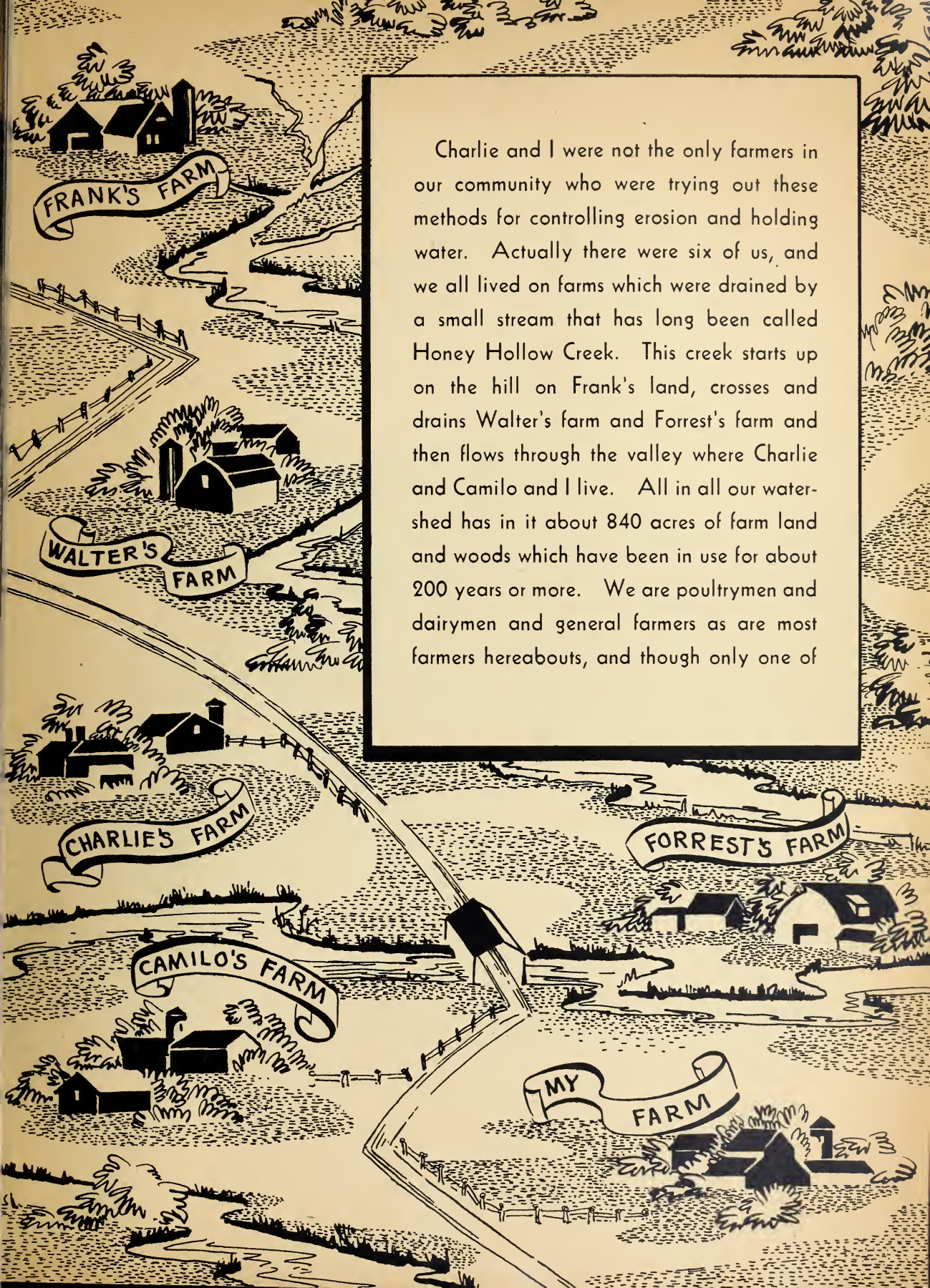
Ordinarily this is about all Charlie would have said, but somehow he seemed full of his subject. While we husked together he went on. "You know that sloping field behind the house where I planted the potatoes this year? Well, I planted it on the contour, and I wasn't sure at all whether it was going to do any good or not. Along in June a gully-washer hit us, the only soaking rain we had all summer. I guess you remember it?"

I remembered it all right, for it was one of those rains you do not easily forget—drenching, with wind behind it.

"Well," said Charlie, "in the middle of that rain I just had to see what was going on. So I ran out of the house to look at my potatoes, and all those curved furrows between the spuds were standing in water, and the water was clear! After a while the rain stopped, but the water kept standing in those furrows until it soaked in the ground. If you'd have walked out in that field as I did you'd have seen that there wasn't a wash in it, and not a plant covered."

Later, just as I was about to leave, Charlie said: "You know, I'm sure that rain and those curved furrows on the contour made my potato crop. There wasn't another rain to amount to anything the rest of June and July. If that water had run away as it used to on that field I probably wouldn't have had any potatoes or they would have been awful little and poor."

His yields convinced him.



Charlie and I were not the only farmers in our community who were trying out these methods for controlling erosion and holding water. Actually there were six of us, and we all lived on farms which were drained by a small stream that has long been called Honey Hollow Creek. This creek starts up on the hill on Frank's land, crosses and drains Walter's farm and Forrest's farm and then flows through the valley where Charlie and Camilo and I live. All in all our watershed has in it about 840 acres of farm land and woods which have been in use for about 200 years or more. We are poultrymen and dairymen and general farmers as are most farmers hereabouts, and though only one of

us actually inherited his farm we have all been living here for a good many years.

The country in our neighborhood is rolling but none of the land

Honey Hollow Creek was giving me a real headache.

on our six farms can be said to be steep. However, for a long while we have known that there were gullies here and there, and thin spots where crops grew badly. I suppose if the creek had not eventually filled up and flooded all the bottom land we would have gone on for a good many years in ignorance of the problem that we now know is pretty serious. I am told that usually the fellow at the bottom of the hill yells first, and that was the case with us. For on my farm Honey Hollow Creek was giving me a real headache. After a great many years of trying to keep it in bounds in order to protect fine cultivated land nearby from washing I had got disgusted as well as pretty nearly baffled by the thing.

The situation was something like this. For years since these farms were first opened to cultivation, the stream had been bringing down topsoil from the hillside above, and some of the subsoil, too, out of those gullies on Walter's farm. All the soil was deposited in a level area on my farm across which the stream ran. This area of about 8 acres, I discovered afterwards, had, all told, about 18 inches of overlaid sediment on it. And not so strange to say, after you get to thinking about it, the **top** 12 inches or thereabouts was subsoil and the **bottom** 6 inches topsoil. Naturally the topsoil came first off those hilly fields and the subsoil later after the gullies had begun to form.

I am sure that field was once a good meadow and that the first farmers who lived here used to pasture their cattle on it. But it had become an unusable wet area overgrown with rank grass unfit for grazing, the stream winding about it in dry seasons, and the whole going under water in times of heavy rains.

About 8 acres of my farm was covered with sediment.

After a good many years of living with this problem and doing all that I could do alone in the way of throwing up dikes, I went looking for advice. It was obviously impossible by our own labor on this farm to dig out a stream bed big enough to hold all that water. And certainly I could not afford to pay for machinery to do it for me. Moreover, it looked to me like a hopeless thing, for surely whatever ditch was dug would soon fill up with more of that sediment from the hillside above.

Now I had heard that farmers could get advice from the Government on flood control and such matters, and so I hunted for some answer to my problem. Eventually a representative came and looked at the situation with me. I will never forget that day for it was really the beginning of a new chapter in my farming. We stood out in the field near the house and looked across the lowland and up the hillside, and pretty soon the Soil Conservation Service man said: "Sure, you can't solve that problem by yourself. That's a watershed problem. Those fellows up on the hillside are losing their soil, and you are getting it and can't use it. All of you ought to get together."

This field was once a good meadow.

N J-R2-2

I learned my problem was a watershed problem.

Well, I had never thought about a watershed problem before. It was a new term to me. I had never thought it would do any good to get together on this problem. Suppose we did, what could we do together?

"What could you do together? Well, you could do an awful lot if you really wanted to," said my Soil Conservation Service friend. "If you fellows will meet together with one of our men we could study the problem a little more. Perhaps we could draw a map and make a plan, and come to some practical agreement as to what should be done. Would you like to try?"

"Sure," said I, "and I think my neighbors would, too. They aren't so interested in my flood, but they are interested in their soils that are getting away. I'll go see them."

A NEW IDEA CAME OUR WAY

About 10 days later, during one of those heavy rains we sometimes get in early September, when Honey Hollow Creek was running high and muddy under the bridge at the end of my lane, we six farmers met together with the local representative of the Service who had come to think the problem through with us. It probably was a good day for us to meet to talk about erosion control, for there certainly was some of our land going down the stream to the river. We could not escape that fact.

It was a good day to talk about erosion.

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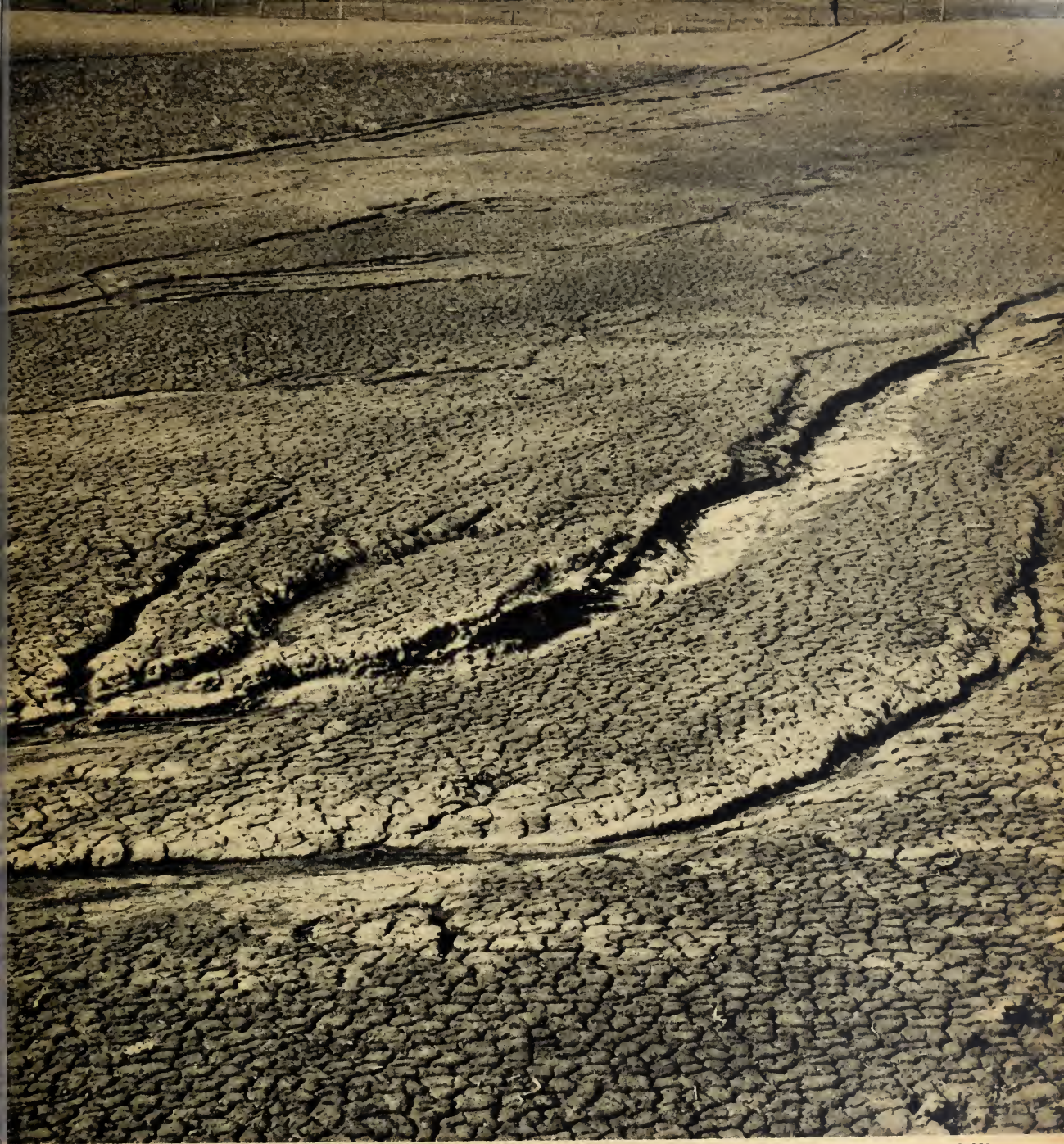
Pictures of farms not unlike our own where erosion was going on.

DEL-10.089

Gullies caused from up-and-down-hill farming.

Washes across cornfiel



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ıd across newly planted wheat.

N J-30.495

Creek beds filled in with topsoil from farms . . .

I remember we looked at pictures that day of farms not unlike our own where erosion was going on, washes in cornfields, washes across newly planted wheat, small gullies, filled-in creek beds. "I guess we all have erosion like that, too," said Walter, who lives on the farm just above mine. "I know I do. I try to stop it with sodways in some places. I rotate the crops too and plant grass, and my grandfather built some waterbreaks 75 years ago and they still work on the farm. But it don't seem to be enough."

"It can't be or the creek bed wouldn't be filled in," said I. "I have washes too. What do you think we can do about it?"

"You fellows down there in the valley can't solve the problem by yourselves," said Frank. "The trouble really starts up on my farm where the creek rises."

Looking back on the meeting I think it was this remark of Frank's that set us fellows to thinking differently about the whole problem. If washing started up on his land as he said it did, and the stream wound its way down across all our farms and was constantly carrying off the sediment which got washed into it from all our fields, then this stream made for us a common problem. Maybe we had to do something about it together or at least think about the problem together.

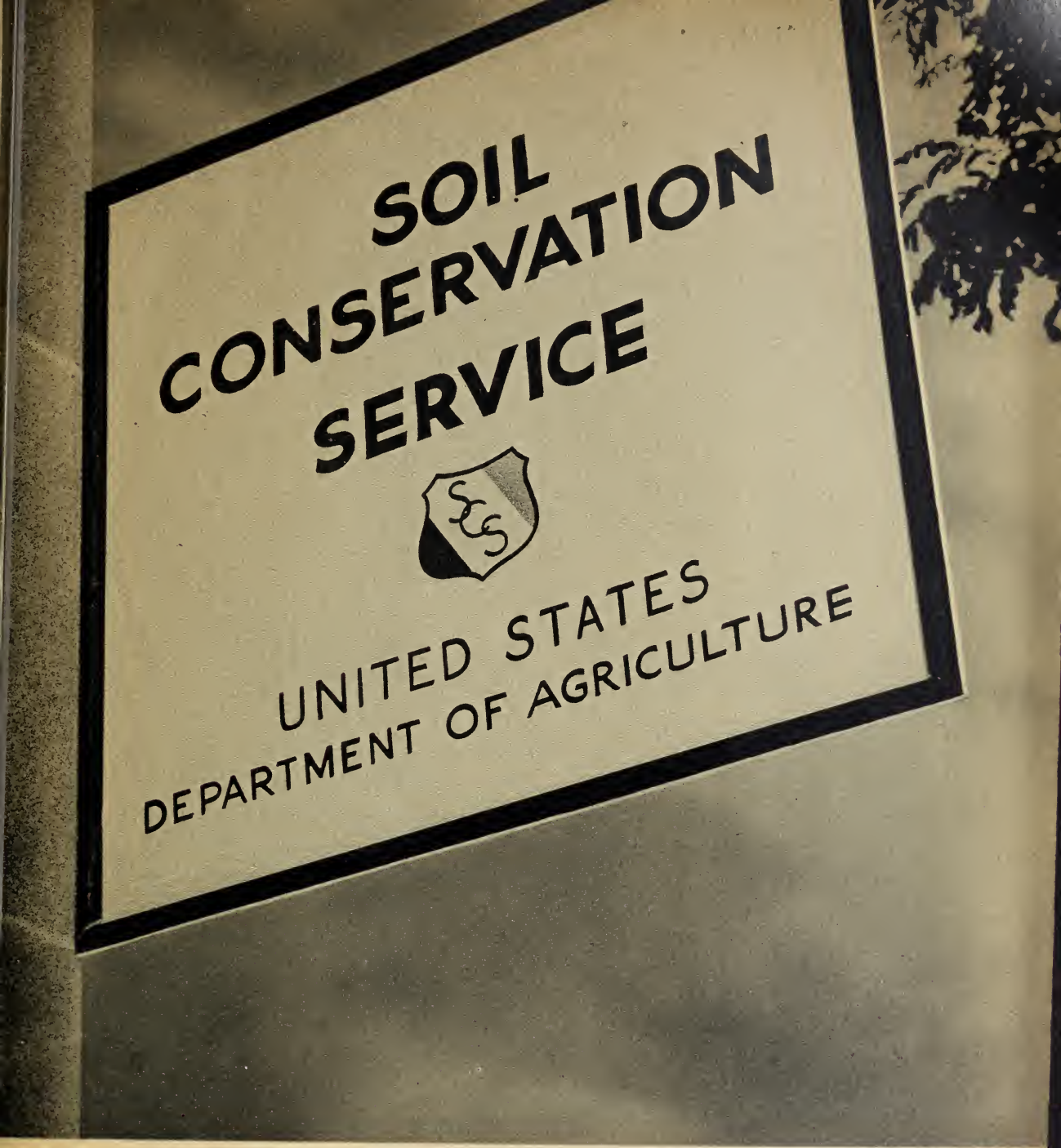
The upshot of it all was that before that day ended we agreed that we did want to know more about the situation, and that if the Service would survey our farms and draw us a plan we would do our best to follow it. We were not promising much until we knew more. But we all felt we ought to get facts.

"What's it going to cost," said Forrest. "We ought to know that before we go any further, don't you think?"

"Yes, you should," said Mr. Carter, the Soil Conservation Service adviser. "That's very important and it's not very hard to answer either." Most of the practices for controlling erosion in the Northeast, he told us, can be done by any farmer with his own tools. It is not the difficulty or the costliness of what you do so much as the way you plow and plant a field that will check the run-off and erosion. If we would begin to think about soil conservation as a watershed problem, we were told, the Government would help us survey the farms, draw up a plan, and put in our base lines wherever we had to change the field boundaries. Then each of us would work his own land, but what each one did would help correct the situation created by that stream out there.

That's how we got started. I must say that although we were much interested when we went home that day, none of us really thought we were beginning something extraordinary or anything like that. Nevertheless we did at least have the feeling that we had got hold of some practical suggestion about handling an old enemy. Perhaps I am wrong in saying we even thought of erosion as an enemy. I guess we did not think it was bad enough for that. For except in my own case where I had that silted in area with its floods staring me in the face all the time, we really regarded erosion only as one of those things that were going on all the time on our farms. It was probably bad enough, of course, but no one seemed to be licking it as far as we knew. Therefore most of us just crossed it off our minds and stopped worrying.

But now we had a chance at a plan. Perhaps something could be done after all. But would it be too hard? Would it be necessary to make changes in our habits and cause a lot of adjust-



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We found the Government would help.

ments? Already before the Soil Conservation Service men got around to map our watershed we began to hear about plowing in curves instead of straight furrows, and that seemed strange and sounded difficult. And we read about planting narrow alternating strips of crops, and that seemed like cutting up the farm badly. All of us were used to fairly large square or rectangular fields, and since we had never planted any other way a change seemed like the adding of a lot of work.

PA-40 345

In curves instead of straight furrows.

Planting narrow alternating strips of crops.

WE TALK WITH FARMERS IN THE NEXT COUNTY

Walter came over one day and said, "I hear some farmers over in the next county are doing soil conservation work. Why don't we go and talk with them, and see what they think of all this?"

That seemed like a good idea. You can learn a lot from a fellow who is doing the same thing you are interested in. So all six of us talked it over and one morning got in Forrest's car and drove to the next county to see what we could see.

That trip was the best thing we could have done. If we had doubts about some things we lost a lot of them at least. The men over there had been at it for about 3 years and we saw contour strip planting, and sodways, and some broad terraces, and we talked about rotating crops in strips and whether they had increased their acreage of grass.

They had been at it for about 3 years.

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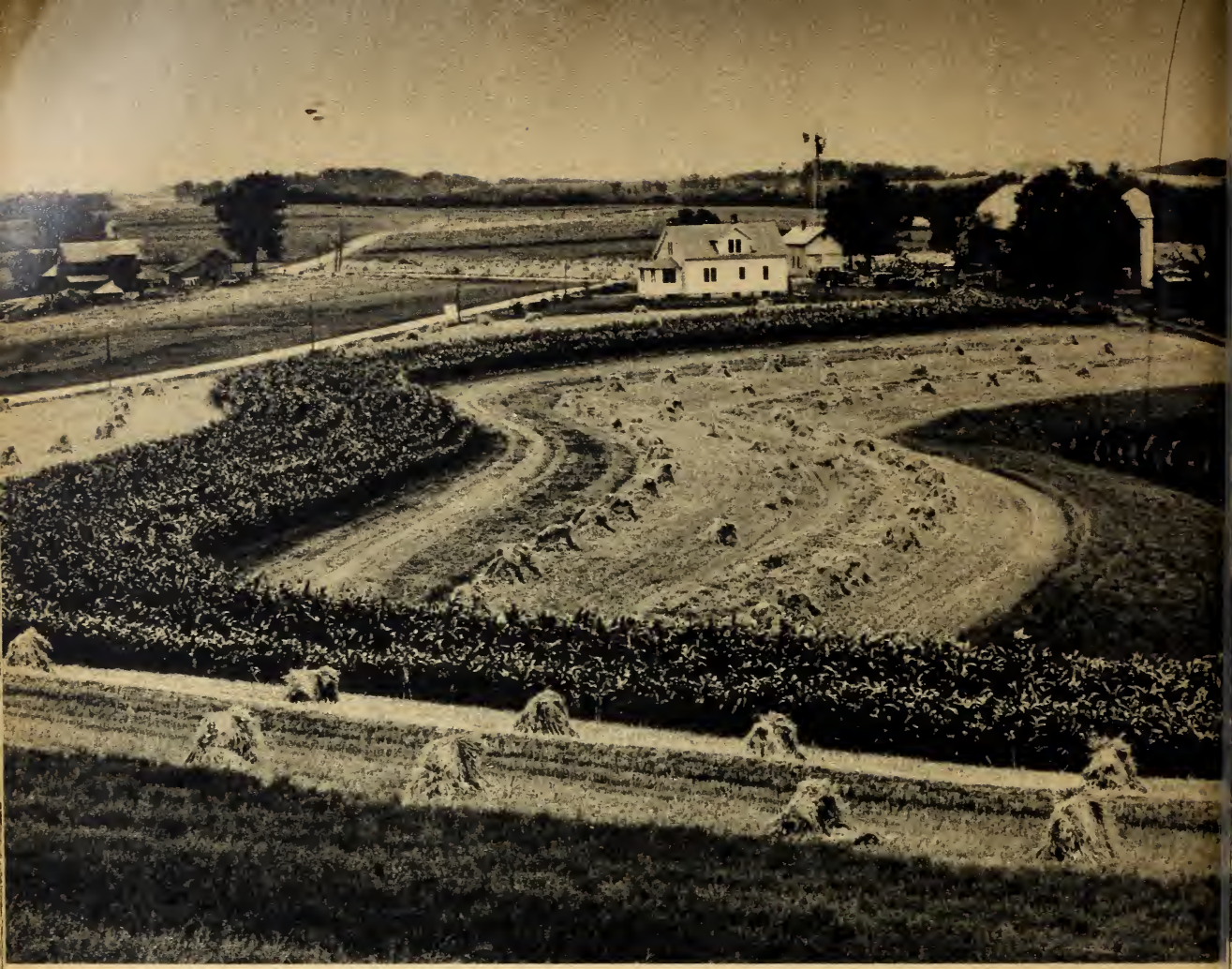
We saw contour strip planting—

ınd sod ways.

PA-55,068

Some broad-based terraces—

d talked about rotating crops in strips.



Hard to change? They said, "No" . . .

We asked them if it was hard to change over from square fields to these curved ones, and they all said, "No," in such a certain way that you could not help but be impressed.

We had believed those Soil Conservation Service men, of course, when they told us erosion could be controlled, but what we wanted to know was whether farmers could control it and make a living at the same time, or perhaps even make a better living. These farmers apparently were doing just that. Moreover, they

They used the same plows, harrows . . .

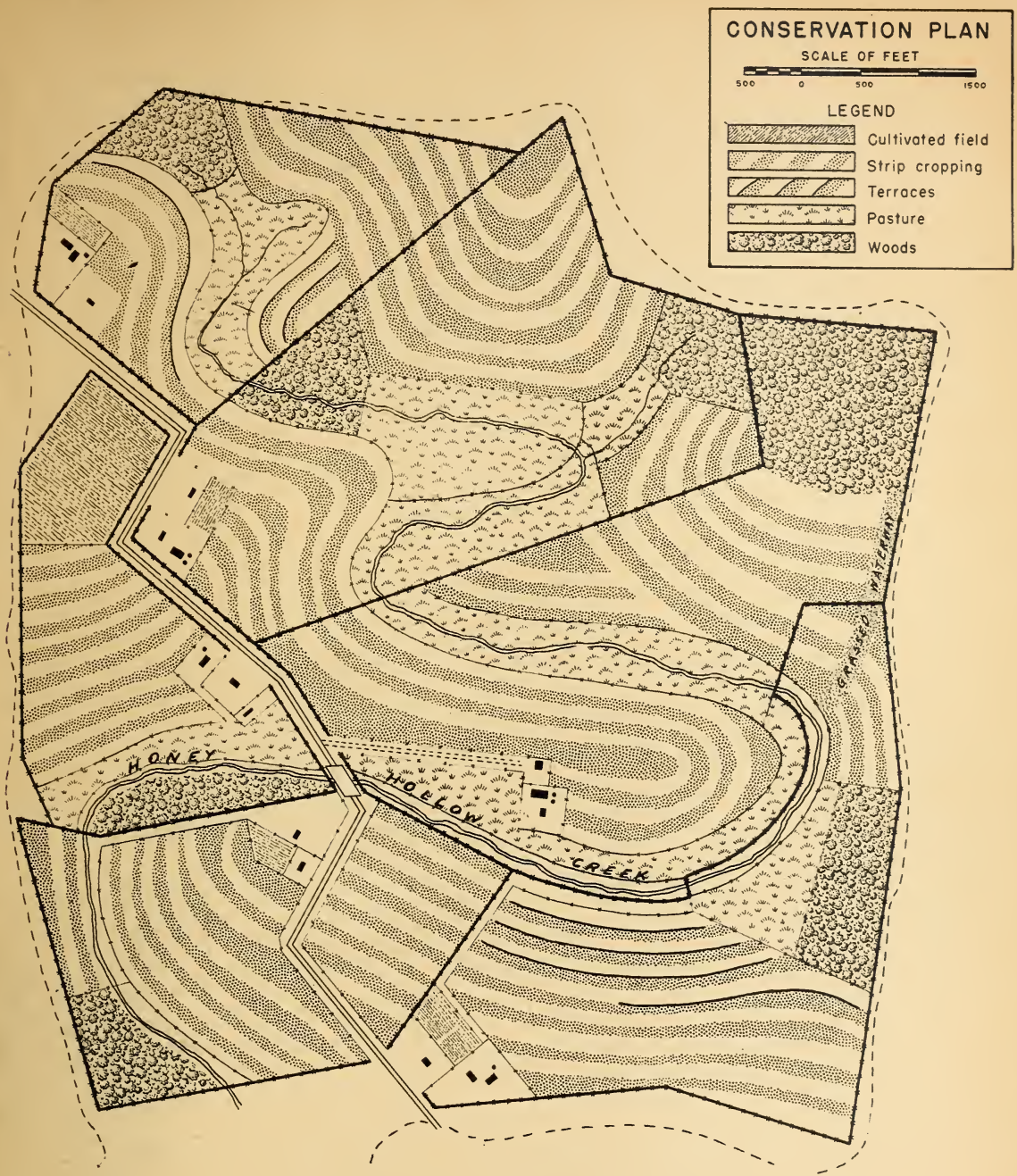
told us that they had not bought any new or special machinery but used as always their same plows and harrows and planting and harvesting equipment. One man said he could not see where it cost more or took more time to plow on the contour. All of those with whom we spoke gave us the idea that erosion could be controlled and that you could go on making just as good a living as you had done before.

WE MAKE A PLAN

Not long after that, Carter, the Soil Conservation Service representative, came to Honey Hollow and began to go over our farms. He studied the lay of the land, and then, with us to help, each man on his own farm, base lines were staked out. He made soil tests and erosion tests and then he went about drawing up a map for our watershed with copies for each one of us so we could use it to plan the work on our own farms.

I remember the day these maps were done and we each had one for our own use. Forrest thought they were fine, just what we needed. Frank was a little skeptical. "I'm still not so sure about those contours," he said. And Charlie, who ordinarily says very little except when he is as sure of a thing as he was later about his potato field, just took his map and declared he had to study it.

But Walter was more certain than any of us that we were on the right track. In fact Walter is something of a pioneer anyway and comes of a family in our neighborhood that has a reputation for doing new things and being progressive. Not long after the Revolution one of his ancestors invented the cast-iron moldboard for plows and had it patented. This enterprising man was a blacksmith as well as a farmer and you can see the site of his forge out in front of Walter's house now. Later, about 75 years ago, Walter's grandfather built "waterbreaks" on his farm which are the nearest things to broad-base terraces you can imagine. Although they are not on the contour, to be sure, they do show that he was well aware of the need for erosion control even at that



The map showed our farms were of a piece belonging together.

early date, and tried to do something about it. Those water-breaks are still working today though Walter is beginning to think they should be improved and put on the contour.

My own reaction to the maps, as I recall it, first centered on that boundary line of the watershed. It was a boundary line I had never seen on any map of our township because it probably never had been drawn before. It was not just the boundary of two or more or even of our six farms. Here was a new area as far as my thinking about it was concerned, the area created by our stream. All the land within that boundary sloped into Honey Hollow Creek, and all of us who lived within it had something in common. Up to now our farms had been just six separate parcels of land. Now they were a piece, belonging together. It was a new thought, and it took a map to drive it home. I remember saying to Walter, and perhaps just as much to myself, that day we got the maps: "I guess we've got something here."

And we did have something very definite and clear-cut to work on. The maps, which we had helped plan, called mostly for strip cropping, but of course, this only meant that some of our square fields needed to be changed and put on the contour. For we soon learned that each field has its own problem according to slope and soil and that there is no one answer to this matter of erosion control.

Charlie was advised to run a sodway down the bottom of a little valley where washing had occurred and it was suggested to me that I continue the sodway across my field which adjoined his. In only two places the maps called for terraces: a slope on Frank's land and one on mine. These were the only places where the

work of changing was such that we could not do it entirely with our own plows and other equipment.

These were the chief mechanical changes which were advised but along with them were suggestions about rotations that might increase grass, and that would alternate fall and spring plantings in the strips.

WE GET STARTED

It was now late September and some of us had already plowed for wheat and could not get started that fall. But some of us did make a beginning and before winter came there were a few contour strips to be seen here and there over the area. It was only a beginning, and to us who had the maps and had an idea of how things would look when all was done, these first steps had meaning. But some of our neighbors thought they were very queer.

In one field, for instance, the map called for broad-base terraces because the field curved and hogbacked at the end of a long slope. The Service helped us do the work even though we were getting to it rather late in the fall, and we finished the terraces along toward the end of October. Just to cover this plowed land for the winter we planted wheat though we suspected it was almost too late to do much good. Cold weather had come, and when finally the wheat sprouted it made so little growth that the ground was not covered at all well. The terraces, however, seemed to work splendidly, for when it rained the water stood in their long curves until it soaked in or ran off so slowly that it carried no soil with it. However, little washes did appear in the almost bare ground between the terraces, and folks coming along and wanting to laugh at us fellows said, pointing their fingers: "See, this thing won't work. The field's worse now than before." Of course, they knew the ground needed cover better than that late wheat gave it, but the little washes gave them a good excuse to laugh.

PA-40 760

It was a beginning.

When spring came we had a better chance to work at contour plowing than we had had at the tail end of the fall season. By June it was possible to look down the hillside and across Honey Hollow and see curved strips of corn and oats all over our farms. Most of us were surprised that we got as much done in one season as we did. Along in late June when Frank's wheat came off, he began ripping out an old hedgerow which divided two square fields and then the second and only other group of terraces in our watershed were put in long curves across the whole area.

In some cases it was impossible to finish the whole of a set of strips because they would run right across an established hayfield. That was one of my problems and Charlie had the same thing to contend with. What we each did was to run the strips up to the hayfield, jump over as it were, and continue on the other side. Later on, when the alfalfa wears out we will connect up the strips. Some folks had told us you had to rip out and lose good crops when you changed from square to contour farming, but that does not seem to be true. At least, we have not lost any crops as yet.

PA-40.759

Planted in strips, never one big seedbed.

Up on Forrest's land there was a fairly bad slope that was in second-year hay. The map called for contour strips, so Forrest plowed out alternate strips for corn and left hay in the others. It made a fine field arrangement, better than our first one in which we alternated corn and oats. This last plan is not so good because both crops are planted in one season, and we will not do this after our rotation gets under way. The idea is to work your rotation around so that you plow up one set of alternating strips in the fall and another set in the spring. In that way a broad slope is never in one big seedbed all at one time.

HARVESTING STRIPS OF GRAIN

After we had gone through one complete season with our soil-conservation program we had a few answers to our questions. But they were not all solved by any means. For instance, Walter has a combine, and he had worried some about the harvest. It looked as if having a number of long narrow strips of oats instead of one fairly large field would make for a lot of back swaths and cause him to lose a good deal of grain.

But it did not work out that way. Walter made the discovery that you could go right down the middle of the strip, turn on the sod headland and come directly back, picking up what the machine had run over. After that the strip could easily be cut from the middle out. We actually backswathed no more than if we had had large fields and gone around them. In the corn harvest I used a corn picker and did the same thing to advantage, and those who cut and shocked set the shocks just off the strip on the adjoining strips so that the cornland could go into wheat that fall.

PA-10.196

We found planting and harvesting offered no serious problem.

DO STRIPS TAKE LONGER TO PLANT?

Another thing we learned had to do with whether it took longer to plow and plant contour strips than an equal area in a square field. Most of our strips are just the width of the usual plow land in a large plowed field. Plowing out a strip is just like plowing out a land, and the strips are frequently longer and therefore better than the old square field.

But we learned that there is one place where this is not the case. The terraces on my hogback field are not parallel. They cannot be, for the land does not slope that way. Therefore the strips are not all of equal width. Alternate ones are regular 100-foot-wide strips and the others are irregular in width. The irregular ones do require a little more time to plow and plant and harvest, but not a great deal more. I know I worried a lot over this before we got to working those irregular strips, and so did Frank, who has terraces too. But we have got over that. They are no headache after all.

AND WHAT OF POINT ROWS?

Then there is the question of point rows in corn. I suppose point rows do occur in strip cropping. I have seen pictures of them in demonstration books, and over in the next county where we went to look at conservation work before starting, there were some point rows to be seen. But on our watershed we do not have any and I imagine the lay-out on farms does not frequently require them. If we planted corn in those irregular terraces there would be point rows, but each year we shift the border line in this particular set of fields and the irregular strips always go into small grains or hay.

Finally, there is the hard-corner-to-get-at. Charlie was telling me that one of our neighbors says he cannot afford to practice conservation because you waste too much land in corners. I think they were talking not long after Charlie's experience with his contoured potato field, and apparently Charlie's answer was: "I'd rather waste a few square feet of land not planted and make a good harvest than the other way around." Looking at Charlie's potatoes roll out this fall I should say there is no answer to his argument. Moreover, I cannot see that you waste much in corners. There are not many such places on my farm and in those few I plan to broadcast mixed grasses for bird feeding.

Camilo rents his farm.

WHERE ONE MAN RENTS

Now, Camilo had a peculiar problem on his farm. Perhaps I should not say it is peculiar because, after all, many farmers have the same kind of problem. Camilo does not farm the land himself now, for he has another job. He rents it to John Thompson. Moreover, some years ago the barn burned and there is no adequate place for livestock, so John merely relies on cropping the land.

When we got the map that day, I remember a curious kind of expression coming over Camilo's face. He said, "That's what I have wanted for this farm for a long while." And then almost in the same breath, "But we'll never get it done on the land, I'm afraid."

"Why?" someone asked him. "You like the idea. Perhaps John will, too."

"Sure, I know perfectly well we have washes on this farm. I know we ought to stop them. And see," he said, pointing to the map, "they suggest we put trees in that corner. . . and over here, too, bad spots to plow! It's good, this map. But John will think he can't afford to follow it."

A year went by and while the other five of us in Honey Hollow got started with our soil conservation John turned up the biggest part of Camilo's land and once again planted corn. That made the fourth consecutive year that corn had gone into those 75 acres, and some of us wondered how long the land would take it.

But the problem was not an easy one. Most of us understood why John did not want to strip crop that land. He could not afford to. The barn had burned so where would he have put hay if he had raised it? And what would he have done with the wheat and oats if he had begun to rotate? He could not house any stock to which to feed it, and here in our countryside it is questionable business raising small grains for the market. John was really forced into making a corn cash crop and ruining that good land if he farmed it at all. He was forced out of conservation work unless the economics of the situation got changed.

How to change them? That was the question. It was not so much a matter of blame as of circumstance. Camilo, the owner, did not have his mind set against a new thing just because it was new and perhaps strange. Not at all. In fact he was one of the first among us to see the benefits of conservation. But Camilo could not afford to rebuild that barn so that John could put on stock and be encouraged to rotate his crops. And because John had become so accustomed to corn cropping Camilo was afraid to offer him a lease longer than for 1 year. It was a bad dilemma.

However, there is just a possibility that the dilemma can be broken. A couple of us watershed farmers rent adjoining land and in both cases there is a 5-year lease making it possible for the renter to do necessary soil conservation work with some degree of security. Longer tenure is important, but, of course, in the case of John and Camilo the problem is complicated by that burned barn. Perhaps in time they will solve that and small grain and grass can be grown and conservation practices started as in the rest of the watershed.

Like a good many other things in our farming we do not know the final answer yet or pretend to. One thing our conservation experience is teaching us and that is that the varied problems which we farmers have are far more interrelated than we ever knew or suspected. The six of us are just beginning to see what a conservation program for farming might really mean. It is all still pretty new, but even now I think we realize that conservation farming might mean more than just putting in strip cropping and changing square fields to contoured fields. Indeed, these things might be only a means to a far larger end.

We began to see this during the winter after our first full planting season when we had time to stop and reflect about what we were doing. Walter and I were talking one day and the conversation got off on the long range purpose of conservation. Walter was forever saying these days, "We've got to keep that topsoil. We've got to keep that topsoil." I guess in reality he had learned that phrase and its meaning from his father, who had learned it from his grandfather who built the waterbreaks. At any rate Walter was getting to be "hipped" on the idea of not letting our "natural resource" or our "capital investment" (he had a lot of names for it) go down the river. "What will our children farm with if we don't leave them some soil?"

"There is no doubt that we have lost soil," I said, "but what makes you think it is so serious?"

"Why just this," said Walter. "I can't raise as good crops as my Dad did, and I think I am just as good a farmer as he. It must be the soil is thinner now. I can't figure it any other way."

So we decided that we had better find out just what the state of affairs really was. How much topsoil had we lost and from what fields had we lost it most? "While we are about it," I suggested, "I would like to know what kind of soils we have in our watershed. It strikes me that although I do know that a part of my farm is limestone soil and a part a sandy loam, I really don't know much about different soils and what they are capable of doing. Perhaps we could farm our land better if we knew some of these facts."

This is little to leave children.

The upshot of all this was that Walter and I persuaded the others that we ought to know more about soils and how much erosion has actually taken place. Then we went to the Soil Conservation Service and showed them we were interested and wanted help. Would they send a man to figure this out with us?

Would they! They were just waiting for that kind of interest and request.

What we now began to learn was aplenty. Of the 849 acres of land in our whole watershed 168 are in woods and permanent pasture. Of the rest, most of which is in cropland, 356 acres show from 25 to 75 percent of the topsoil lost. That was startling for none of us thought that our farms had lost that much soil. They had been farmed for a good many years, to be sure, for some of the farm houses had date stones reading 1756 and 1745. But on the whole they have probably been farmed like most of the land hereabout, and this is generally thought to be good agricultural country.

Forrest, who can do that sort of thing, got busy and wrote to find out how we compared with the erosion figures for the whole State. To our surprise we found that on about half the arable land throughout the State 25 to 75 percent of the topsoil was gone. Conditions on our little watershed merely reflected the situation in the State as a whole.

Now the way we found out this surprising fact about our farm land was by learning with Carter's aid, what soils we had and where they were. He went around with a soil auger, boring a lot of holes all over the place. Then with the facts he discovered he made a soils map showing where the different soils lay. For

We found 25 to 75 percent of the topsoil lost.

Precious.

instance, most of my land has Duffield silt loam and most of Walter's and Frank's land is Edgemont gravelly loam. But I had a little bit of six other soils, and all the rest of the men have several soils too. Our soils do not lie neatly divided but there may be two or more in one field.

The depth of all soils in the woods where there has been practically no erosion has also been tested. As a result it is known how deep each soil was before erosion started. All we had to do then was to find out how deep each one of our soils was at present, and at once we knew the bad story of how much of that precious land had already washed away. It is precious, too, when you realize how long it takes nature to make it. When man does not interfere nature takes from 500 to 700 years to build 1 inch of topsoil over an acre of land! And we frequently cause this to wash away in a few years.

WHAT IS A FIELD CAPABLE OF YIELDING?

"I'm mighty glad I know now what kind of soils I've got on my farm," said Charlie to Carter. "But how's that going to affect my planting? That's what I want to know now."

"Look at it this way," said Carter. "When you know how deep the soil is in your field, then you know how much soil you have left to deal with. When you know what kind of soil it is—heavy or light, friable or compact—and when you know how steep the land is, then you have something to work with. First of all you will know whether you should grow crops on any given piece of land or whether it should be in pasture or planted to trees. And if you decide that the field can grow crops, you will know better whether you should plant on the contour, use strip cropping or perhaps terraces. Your knowledge will even suggest the kind of rotation you should use."

"But," said Charlie persistently, "I wouldn't plant crops where it was so poor only trees would grow. I think farmers have mostly figured these things out for themselves from their own experience anyhow."

"Let's go and look at your farm for a test," said Carter. "It just might be that you are farming a field or a part of a field in a way that you really oughtn't to be farming it."

"All right," said Charlie good-naturedly, and they went out to a field toward the back of his farm where the land is pretty steep for our watershed. A part of this long field Charlie had in permanent grass but a part he rotated to crops. They got out the

soils map and checked up that field, finding it was an Edgemont gravelly loam with a 17-percent slope and that practically all the topsoil had been eroded off.

"According to my figuring," said Carter, "that field ought to be in permanent grass. You don't really get good crops on it, do you?"

"Well, not so good," admitted Charlie and smiled his broad smile. "I guess you win. But it is true I had thought that some day I would stop cropping that field."

"We really both win," said Carter. "Farmers are, on the whole, mighty clever in their land use. This method is just a little more accurate. You can't go wrong when you know the facts."

You can't go wrong when you know the facts.

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WE DECIDE TO KEEP RECORDS

In spite of the fact that Walter was forever harping on the idea that farmers had a responsibility to their children in the way they handled their land, the six of us were also quite as much interested in what soil conservation might do for us in our own generation. I do not mean to say that we did not agree with Walter, for we did. How could we help it when we were faced with the grim fact that our predecessors had passed on to us only about half the topsoils which nature had put on our places?

On the other hand we wanted to know whether we were likely to make more money this way than the way we had farmed before. Would strip cropping, terraces, cover crops, contour plowing, and the like tend to hold more moisture and more soil and fertilizer in place so that yields would increase? We asked this question, but no one we talked with seemed to be willing to say "yes" or "no" or commit himself definitely.

If that were the case, we said, we simply would have to keep records. So we took the last year before we switched from square fields to curved contours and decided that could be a kind of starting point. We added up all the acres on the watershed in corn and in oats, and in wheat, in alfalfa, mixed hay, potatoes, and fruit. And we worked out the average yield of each of the crops for the watershed. It was not what Charlie's yield had been in each crop or Forrest's or Walter's or mine, and so on. It was the average of these yields. For what we hoped to find out was whether in the next 5 years we would make any improvement on our income by doing a whole-watershed conservation job. We

planned that each year we would work out these average yields and compare them to see if over a number of years there would be an improvement that we could credit to soil conservation.

We wanted to know if soil conservation methods would sustain or increase our yields.

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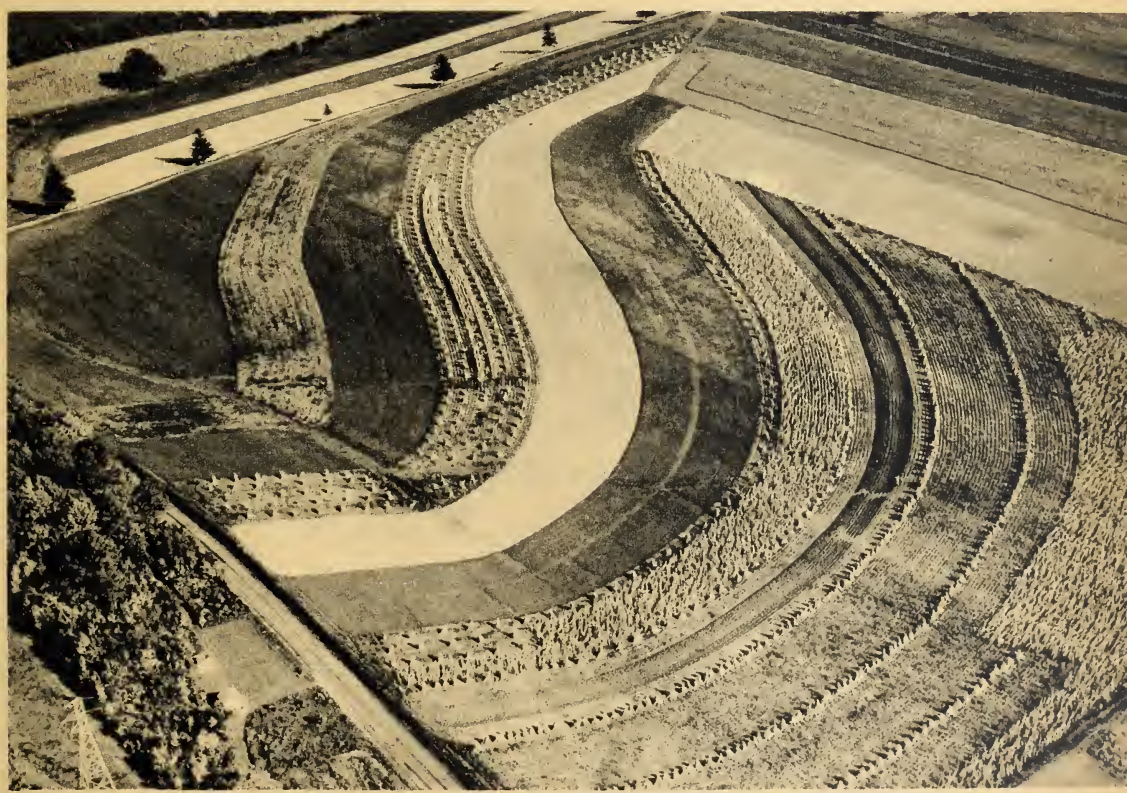

WE COME TO THINK ABOUT BETTER ROTATIONS

The working out of average yields for our farms got us to thinking about our rotations. Generally speaking we used a corn-oats-wheat-hay-hay rotation. Some of us grew a little barley and Charlie grew potatoes. Most of us thought oats a headache. As a poultryman I did not need as much pasture as Frank or Walter did with their dairies, and my rotation forced me into a lot more hay than I needed. Charlie seemed to have the same trouble. Nevertheless, everyone was preaching more grass planting as a part of the conservation program. I knew grass was soil building, if you used legumes, and that it held the soil from washing, but with all this insistence on what would not help me as a poultryman, I began to wonder whether this conservation business was not working in part, at least, against my best interest.

One day I asked Carter what he thought about it, and the result was the following suggested rotations, which are based on the yields we were usually making on our watershed. This was a pretty clever way for Carter to answer me and I think these rotations are going to be a big aid to us farmers.

From this it was clear to me that as a poultryman I could increase the total number of feed units per year by cutting down hay and using mostly a corn-wheat-barley rotation, provided sweetclover was used for humus building and maintenance. It was here that I began to see how strip cropping came in to help in this situation. Whereas before I had had a few big fields, I now had a lot of

Rotations recommended for Honey Hollow Creek Watershed

Rotations	Digestible nutrients		
	Grain	Clover hay	Total
	Pounds	Pounds	Pounds
Corn, oats, wheat, hay	104,840	33,380	138,220
Corn, oats, wheat, hay, hay	83,880	53,400	137,280
Corn, wheat, hay	113,100	44,500	157,600
Corn, wheat (sweetclover),[1] barley (sweetclover)	165,830	.....	165,830
Corn, wheat (sweetclover)	169,650	.....	169,650
Corn, wheat (sweetclover), barley (sweetclover), sweetclover	163,830	.....	163,830

[1] Sweetclover is recommended as the most desirable cover and green-manuring crop because of its abundant growth and the cheapness of seed.

little ones. With this method of dividing the farm it was quite possible for me to plant only the acreages of hay and pasture that I needed, always keeping in mind also the necessity of maintaining humus. As long as there were only a few big fields I could never do this. For a rotation which brought hay into a 14-acre field pretty nearly every year almost certainly forced me into more hay and pasture than I could use, even though I never used the same ground as pasture 2 years in succession.

Planting in narrow strips offered definite advantages in crop planning.

WILDLIFE IN HONEY HOLLOW

During the latter part of our first summer some of us began to get interested in a subject which we had never thought of as connected with soil conservation. This was the matter of wildlife preservation. For a long while Forrest has been interested in this matter, and Forrest's son has studied birds in his 4–H Club and on his own. He is quite an expert now. Frank's boys are also pretty keen and know quite a lot. We really start with a good deal of knowledge of this question here in Honey Hollow. But the event that woke us to the importance of doing something to encourage the birds which are helpful to farmers occurred last summer.

A friend of ours invited an official of the Audubon Society to visit us. On one of those hot, still days, which we frequently have in July, several of us, including some of the boys, took a walk over the watershed, and I think our eyes were opened more than they had ever been to the value of birds to us farmers and how we have unintentionally upset the balance in nature by a number of our very usual farming practices. I remember our standing on the hill at the edge of Charlie's woods and looking down over the valley. It was a neat and orderly countryside, with the beginning of fine curved fields on the contour. But there were not many hedges or thickets, and still too little cover for the birds that live along the woods' edge to get out into the wide area of cropland.

Since that day we have done some things about wildlife and we plan a good many more. We feel that the new farming practices

We started a program of wildlife preservation.

we have started will have their good effect on the bird and animal life of our watershed. For instance, at the end of our first full planting season nearly two-thirds of the cropland of our farms is in strip crops; and strip crops, breaking up the larger fields into smaller areas, do provide greater cover. Besides this we have increased the use of winter cover crops, such as ryegrass in corn, and this ought to provide a greater amount of succulent feed in cold weather. Charles has built a pond, and I plan one, while Forrest has done a good deal of tree planting recently and only last season he covered a bad slope with evergreens. Some of the boys on the watershed have made bird boxes and feeding stations, and this winter several of us put out feed in the cover along the woods.

But we are not satisfied with just these measures. Our watershed should have a plan for wildlife preservation—something we can work on a little each year until we have it complete. One of the boys, all of his own accord, is beginning to work up such a plan.

That hot July day when we walked over the watershed and looked at wildlife with our Audubon Society friend gave us a new point of view. We began to see that conservation of soil and water and wildlife are all of a piece in the business of using our resources in the best way.

A NEW POINT OF VIEW

And speaking of getting a new point of view, I sometimes think, while mulling over the various ideas that have come our way since we started conservation practices, that the idea of building a permanent agriculture on our farms is the most important one of all. Back in the beginning, of course, we just got hold of the thought that perhaps we could stop the topsoil from going down the river. But we did not see half of what that might mean.

Now we know there are two kinds of farming. One is wasteful farming, though we farmers have not called it that or even recognized it as such. We let this kind of farming use up the soil, because our minds are too completely centered on getting a cash return for crops at the end of the season. The other kind of farming takes thought for tomorrow, as it were. Men who farm this way expect to live on their land for a good many years to come. They do not expect to move on somewhere else. Perhaps their sons will farm the land after them. These men use every method they can to hold the land and build its fertility while they plant and harvest their crops each year and make their living. This is permanent agriculture.

Honey Hollow is beginning to develop permanent agriculture. We may have a long way to go before we succeed in making our farming so sound and good and durable that our families go on living here successfully and happily for many years to come. We may have much to do, but we know it now. We have the idea, and we are working on it.

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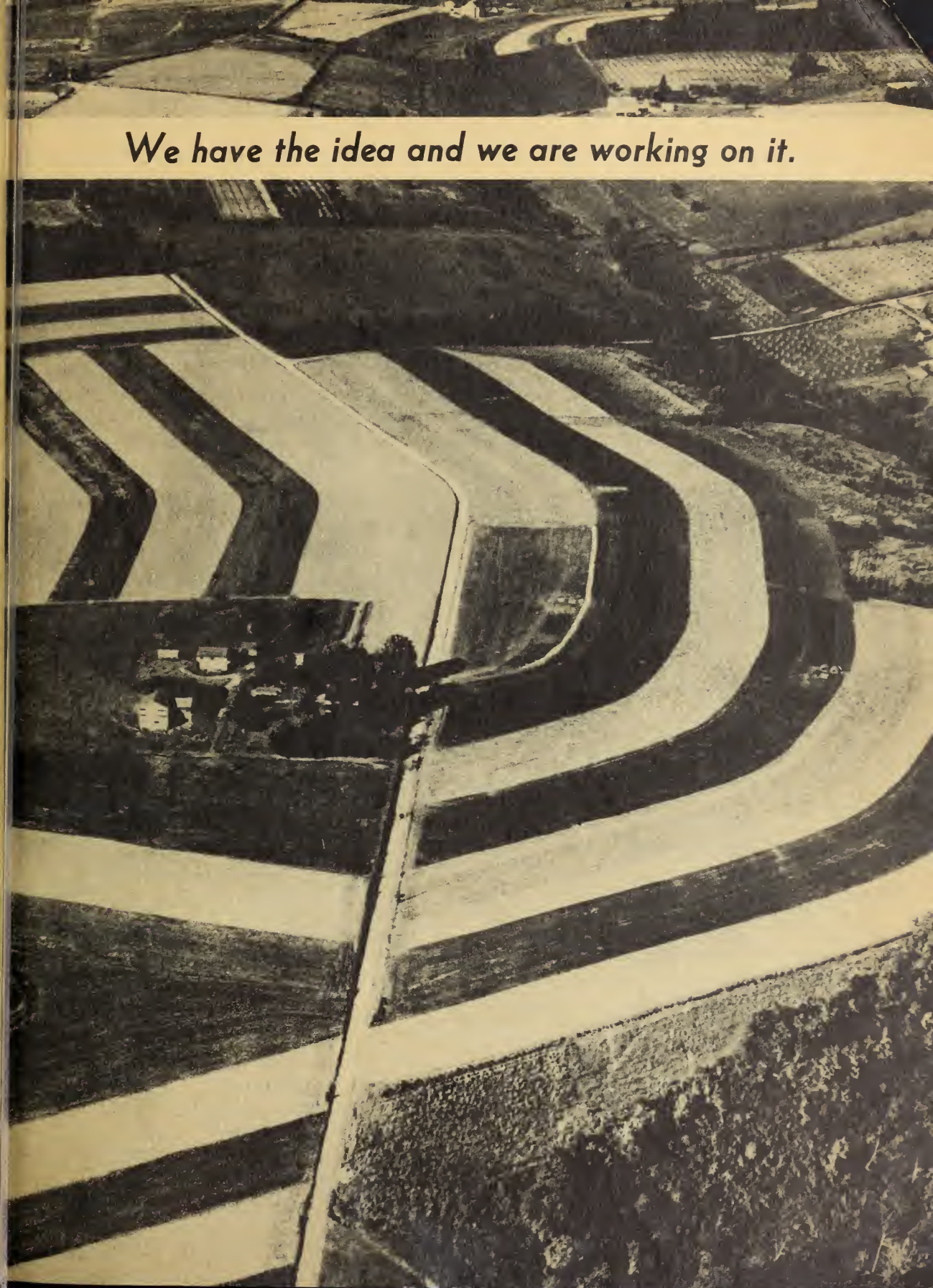

We have the idea and we are working on it.